

The background of the slide features a large, golden, leaf-like structure (the Starshade) positioned on the left side, partially obscuring a bright light source (the Sun). The structure has a central circular opening and is composed of many pointed, leaf-like segments. The background is a dark space filled with stars, a crescent moon, and a small planet. The title "Starshade and the Search for Life" is written in large, white, sans-serif font on the right side of the slide.

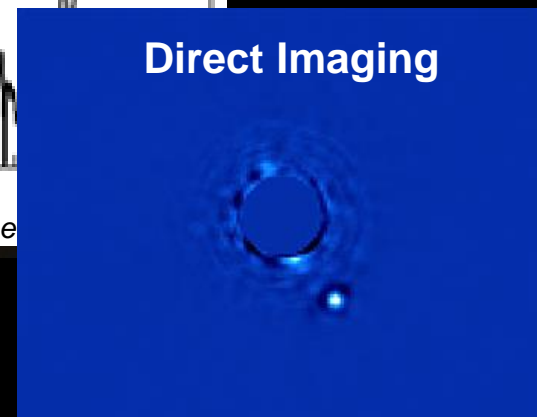
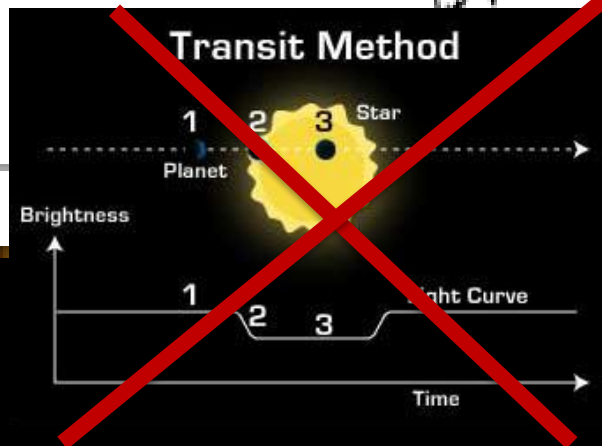
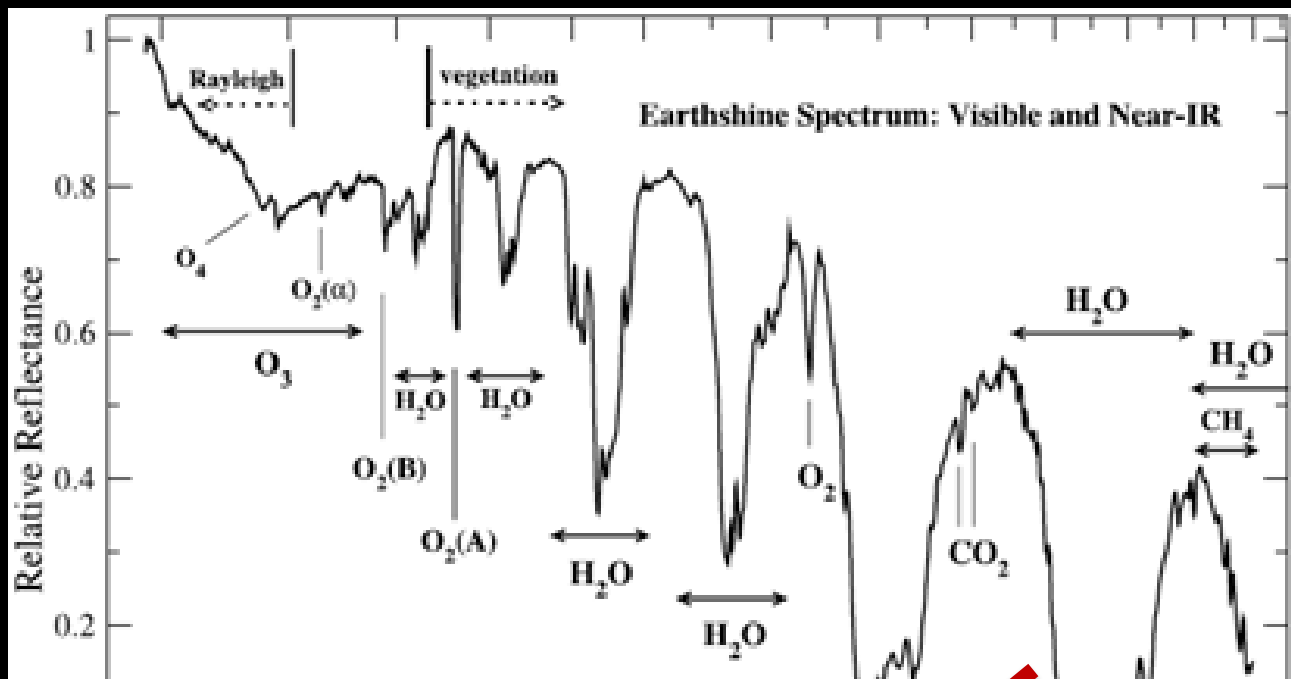
Starshade and the Search for Life

Dr. Nick Siegler

NASA Exoplanets Exploration Program
Chief Technologist
Jet Propulsion Laboratory
California Institute of Technology

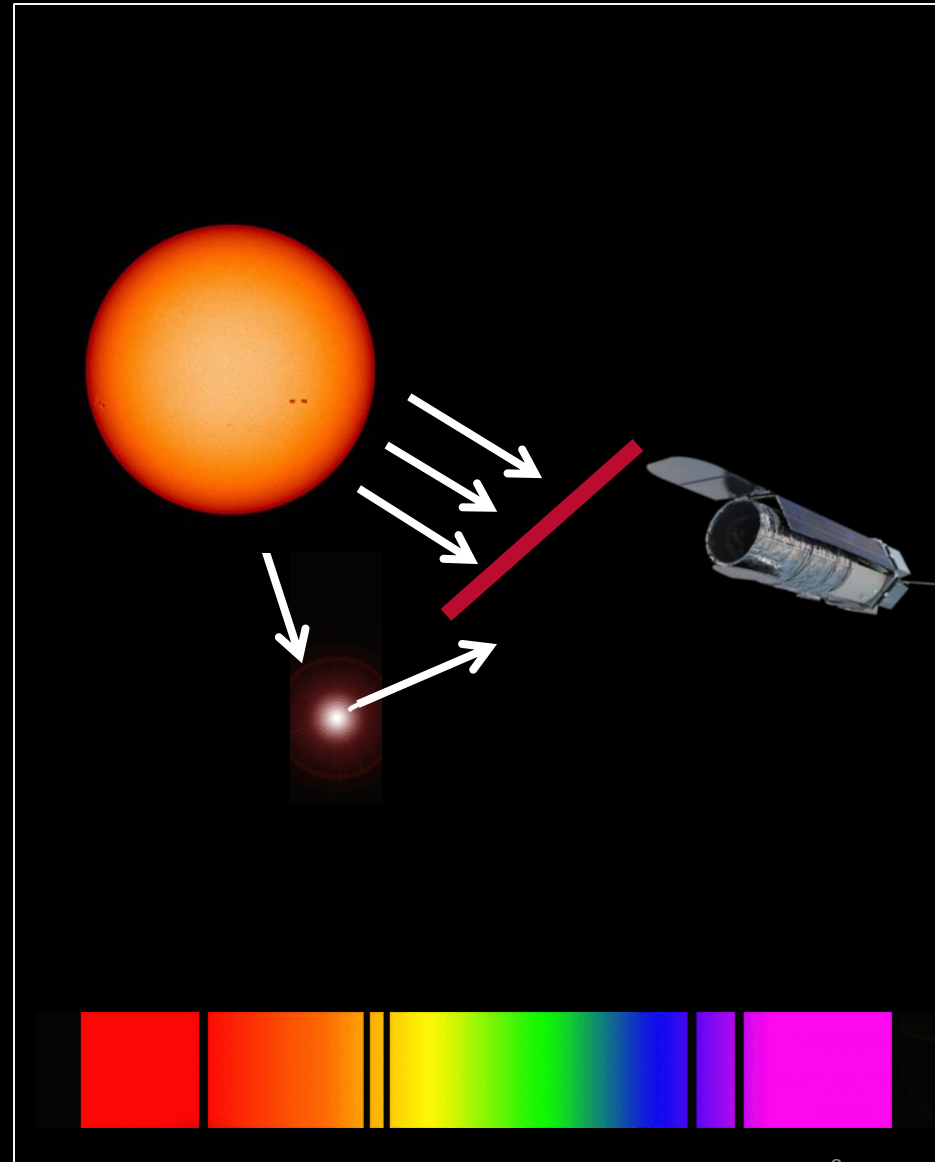
Starlight Suppression

The Key Technology in the Search for Life on Earth-Size Exoplanets



Beta Pic b
Macintosh et al. 2014

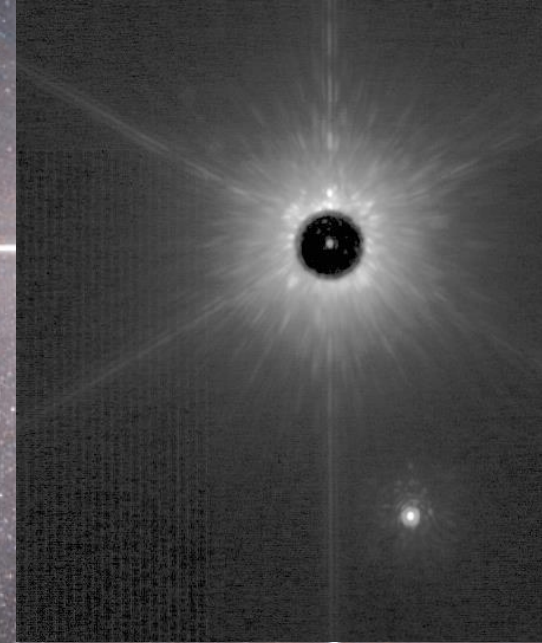
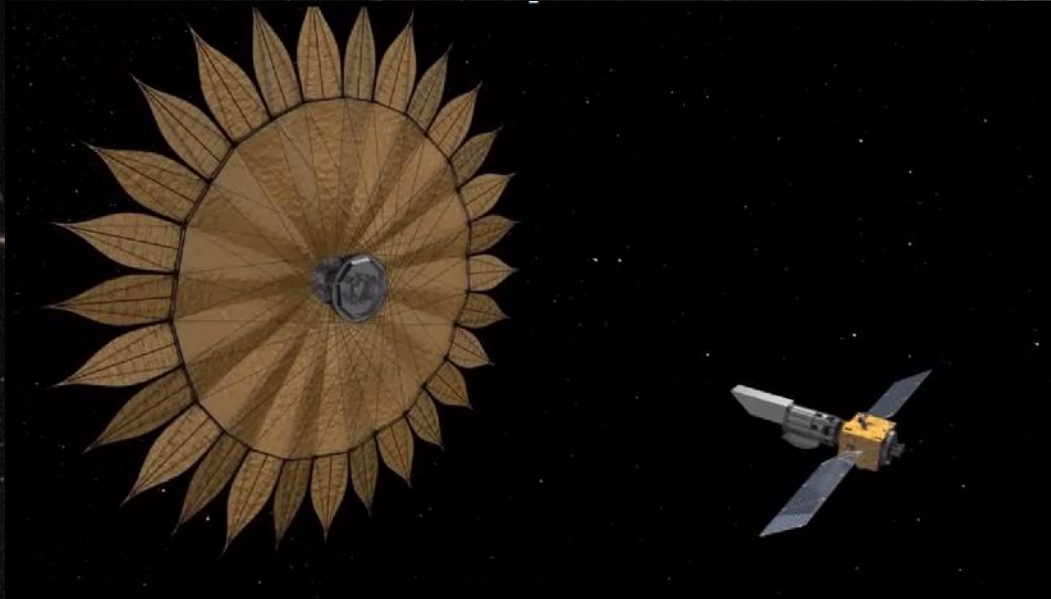
Reflection Spectroscopy



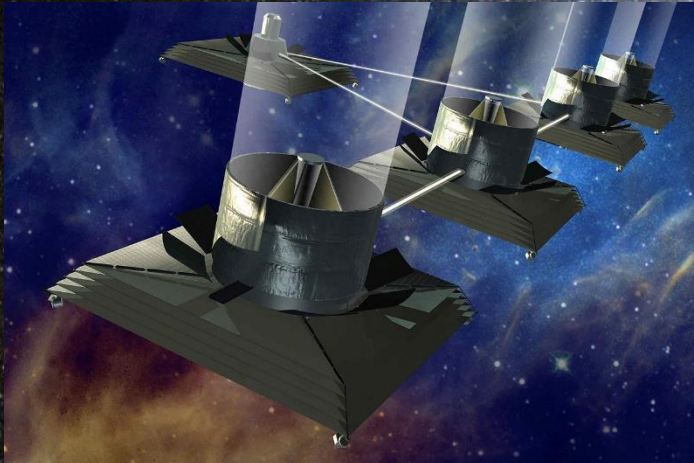
Starlight Suppression

The Key Technology in the Search for Life on Exoplanets

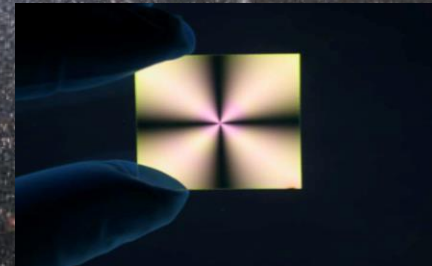
External Occulters (Starshades)



Nulling Interferometry



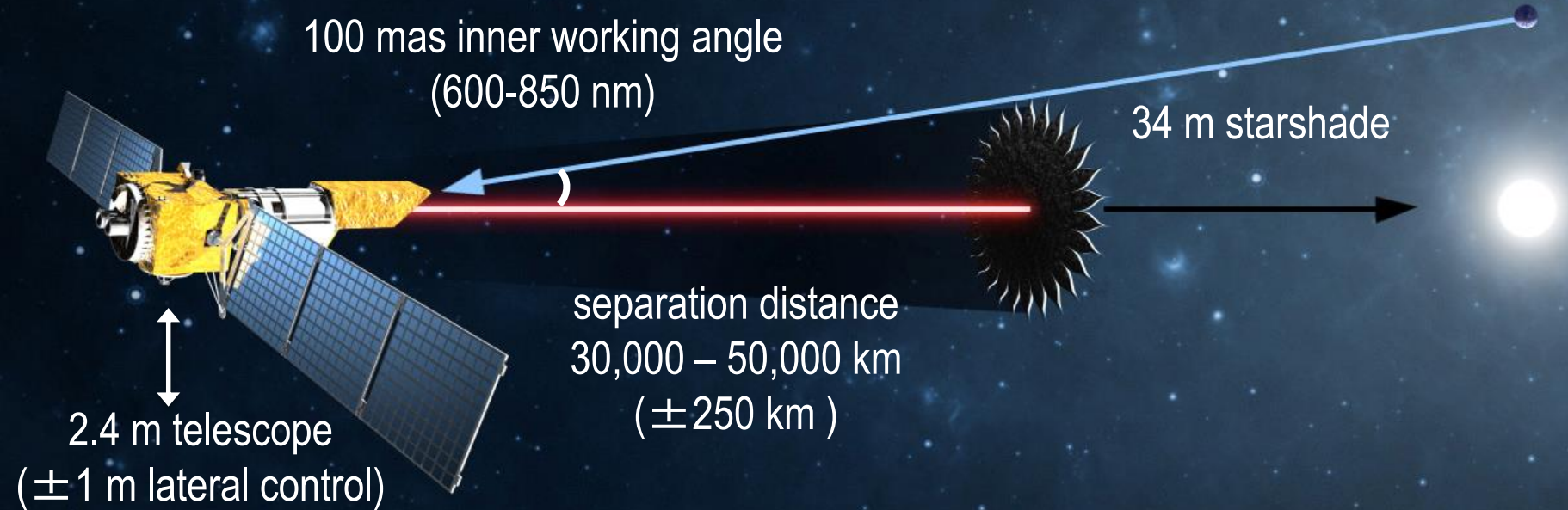
Internal Occulters (Coronagraphs)



A Starshade Mission Concept

Starshade

The hard stuff is done external to telescope



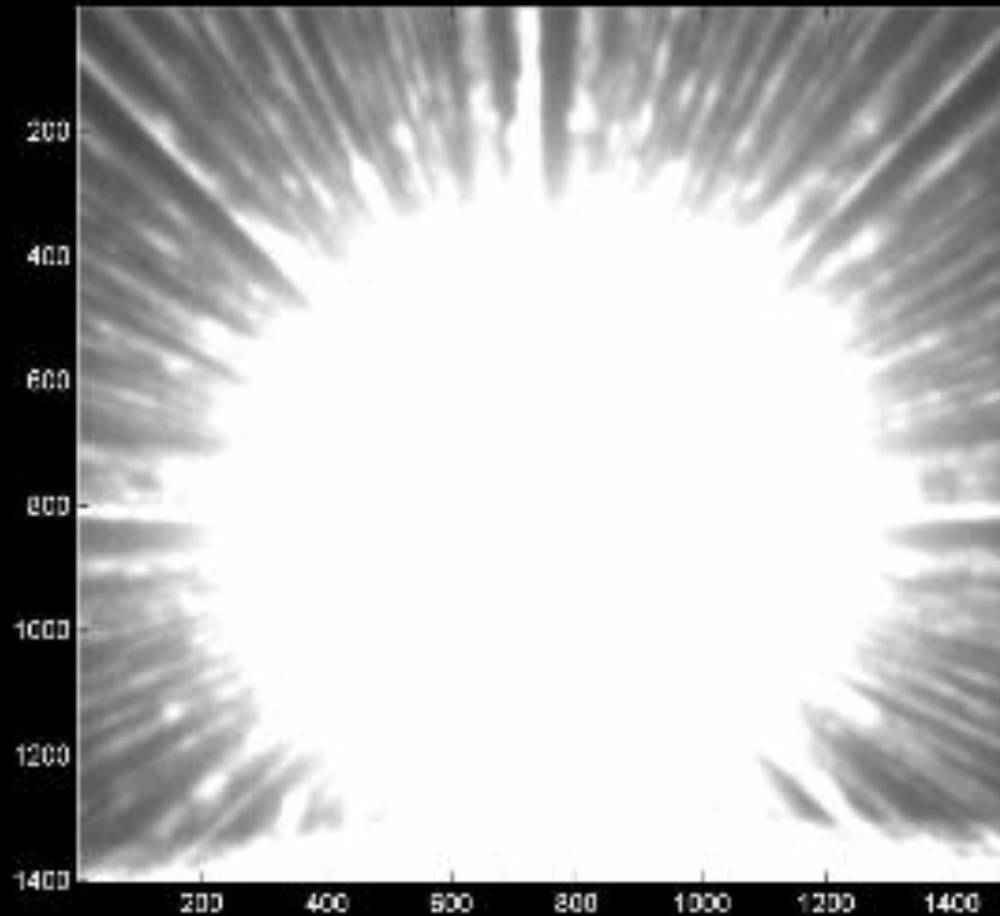
Optical Performance

Desert Demonstration



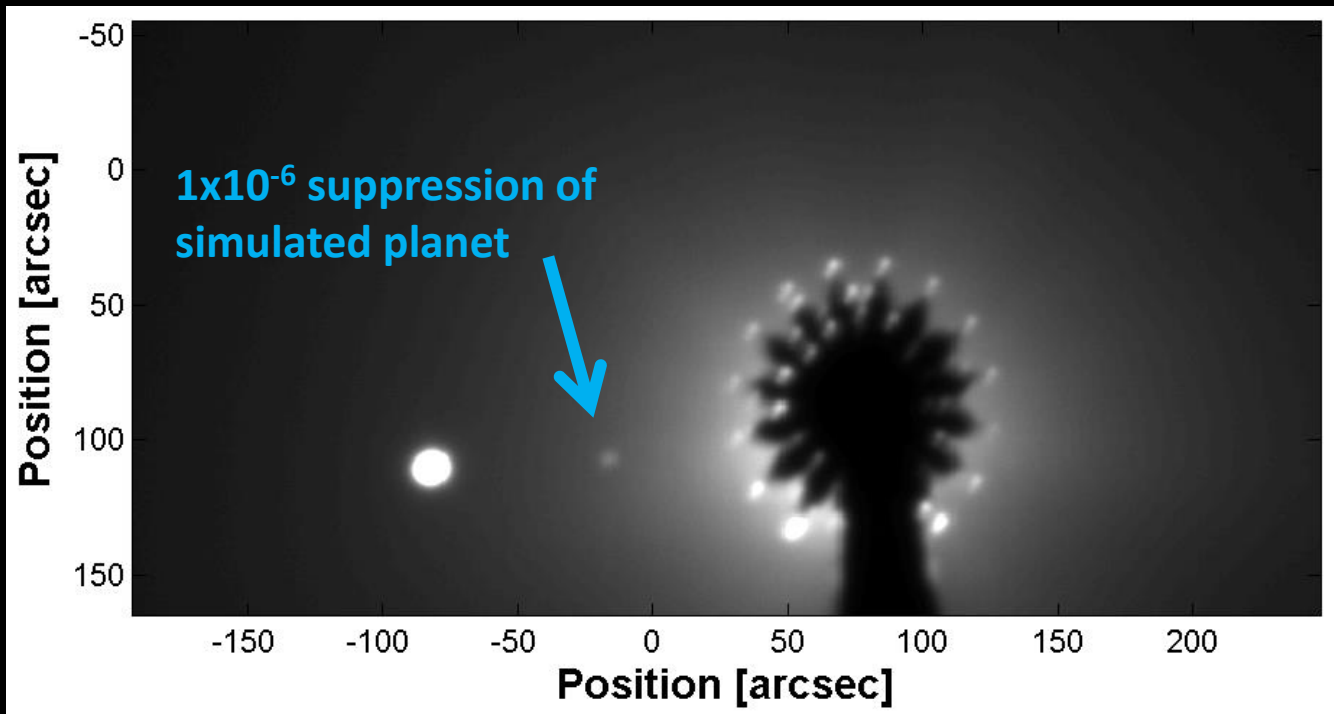
Optical Performance

Desert Demonstration



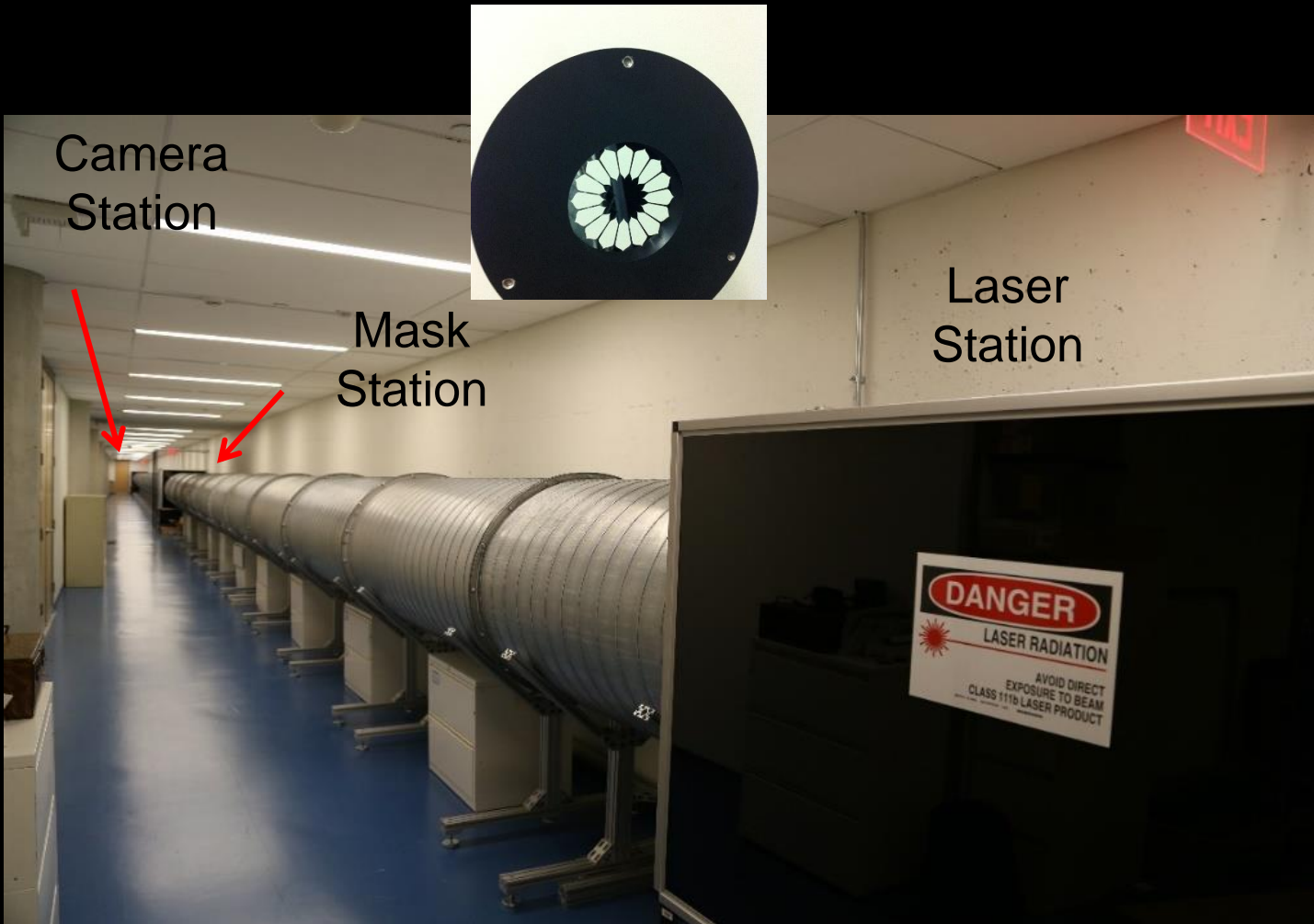
Optical Performance

Desert Demonstration



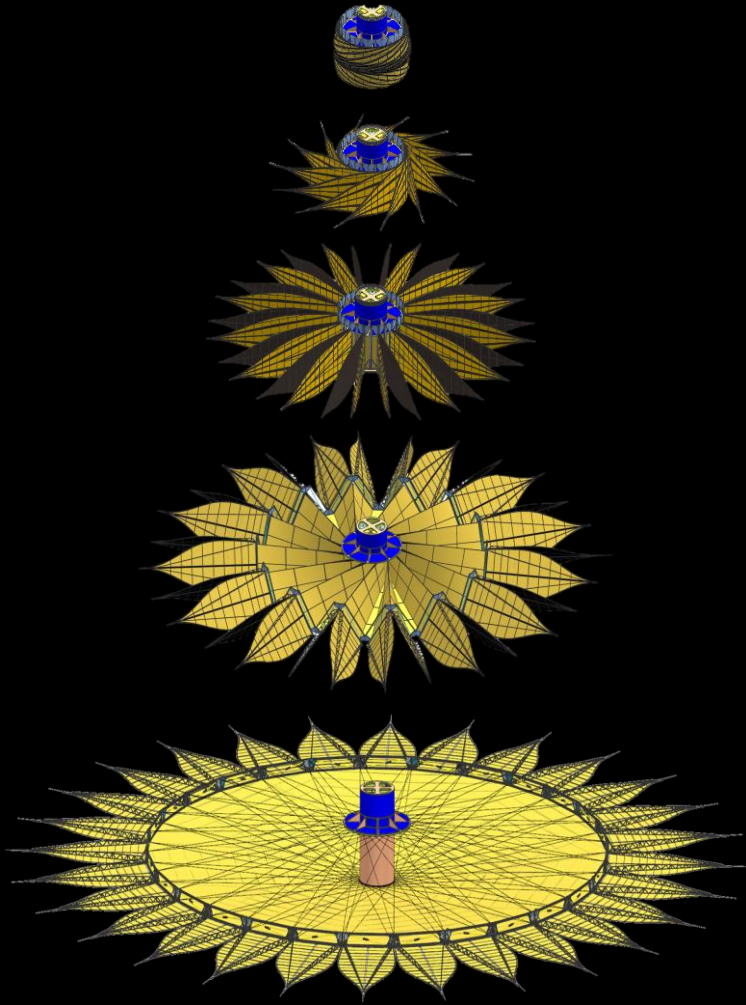
Optical Performance

Starshade Testbed at Princeton University



Mechanical Deployment Approaches

Trade Study Underway with Multi-Institutional Working Group



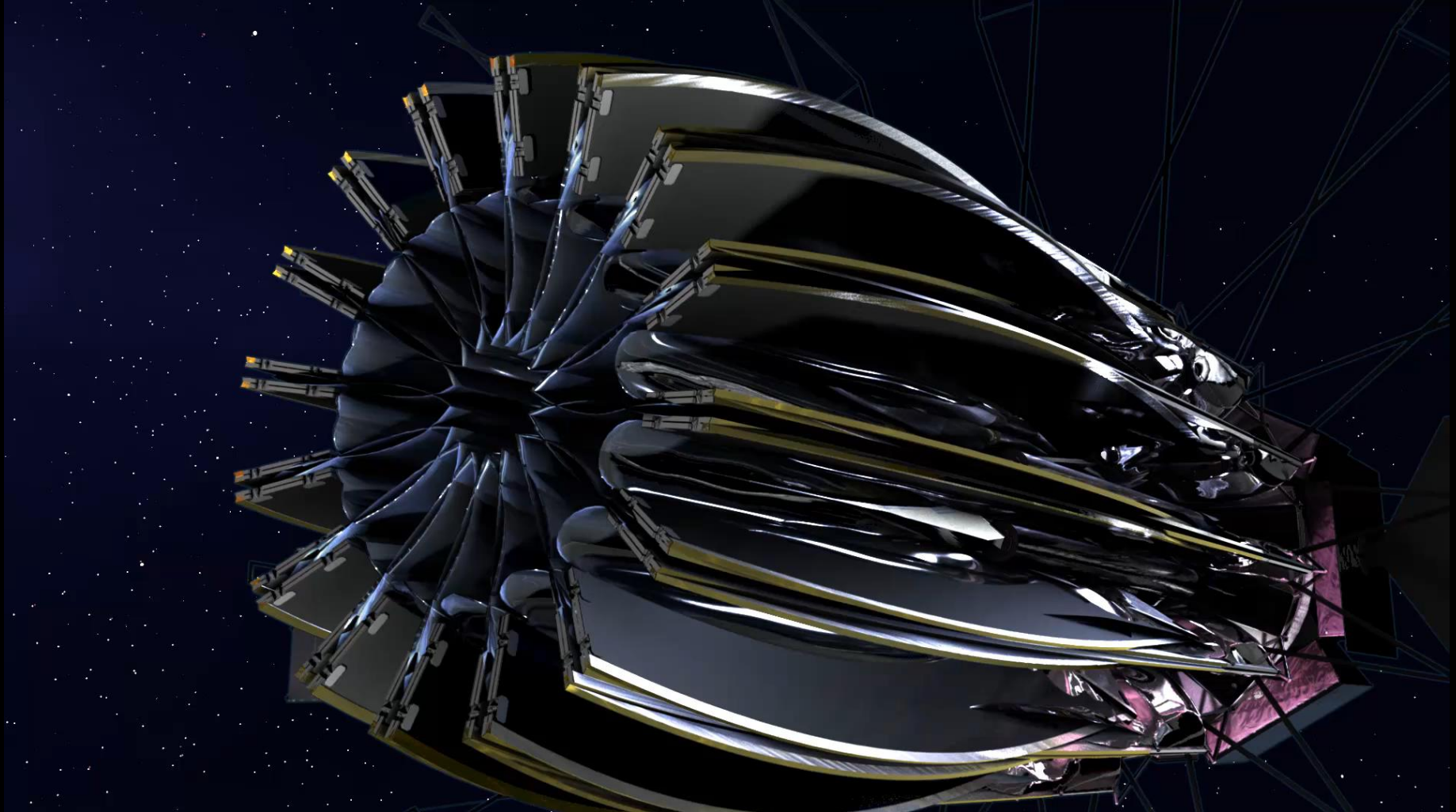
Wrapped Petal Architecture



Folded Petal Architecture

Folded Deployment Architecture

Northrup Grumman Aerospace Systems



Wrapped Petals Unfurling

NASA JPL



Petal Unfurler Testbed 2.0

SBIR Award: Rocco / Tendeg Gravity Offloader



Inner Disk Deployment

10 m Prototype Demonstration (JPL)



Optical Shield Deployment

1 m Prototype Demonstration



Optical Shield Deployment

2 m Prototype Demonstration



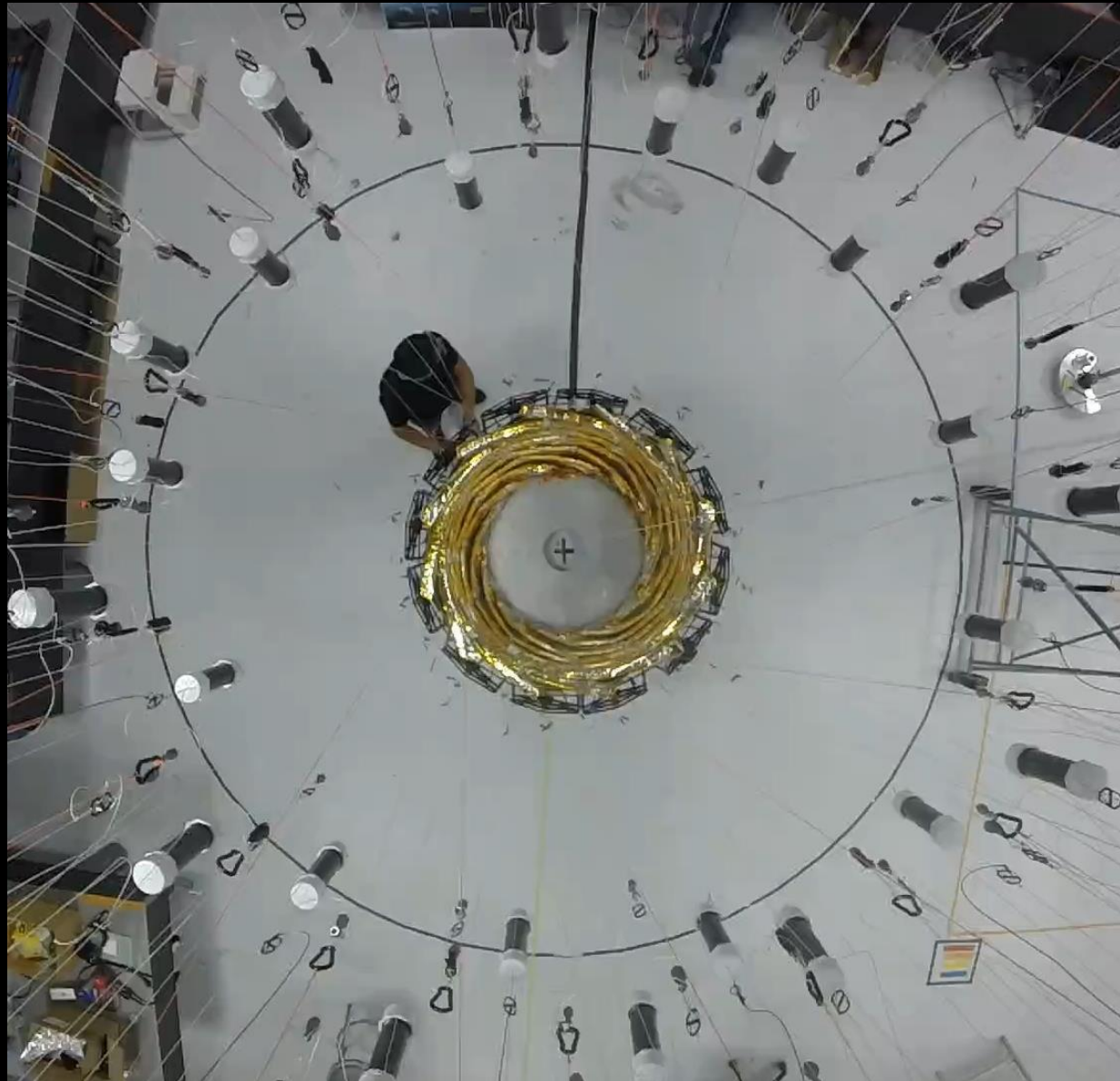
Optical Shield Deployment

5 m Prototype Demonstration

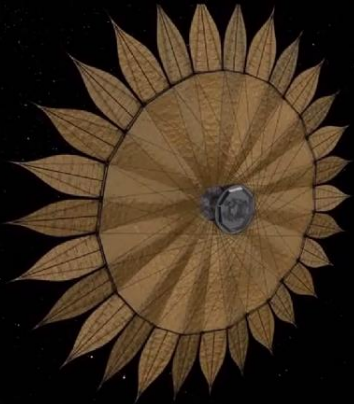


Optical Shield Deployment

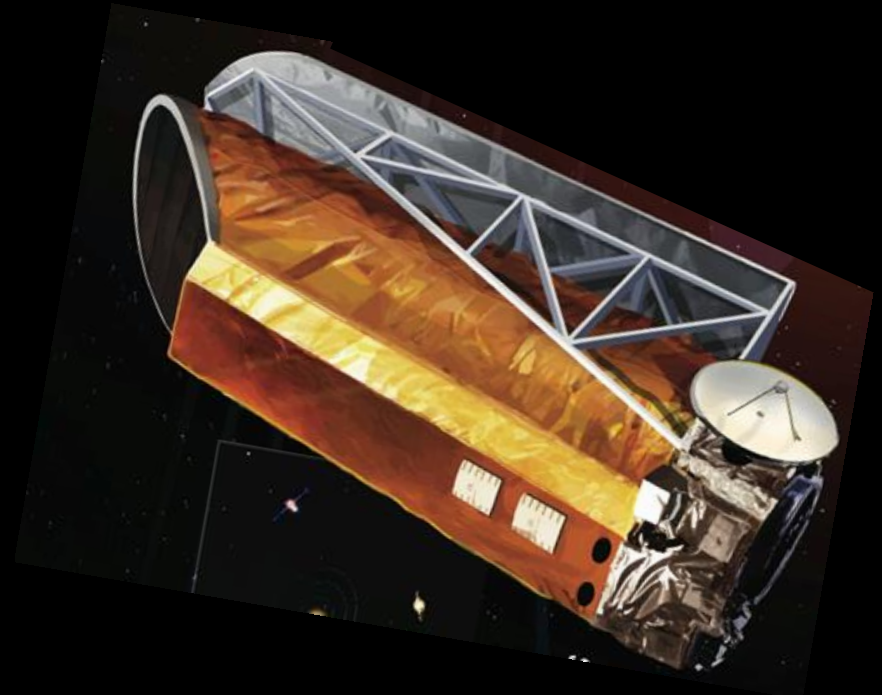
5 m Prototype Demonstration



Possible Future Space Telescopes Using a Starshade



Starshade
Rendezvous
(with WFIRST)



Habitable Exoplanet
Imaging Mission
(HabEx)

*Decision is pending 2020 Decadal
Survey recommendations*



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